Disability and Engineering

PEERs Seminar
Week 6
Today’s Outline

• Announcements
  – Diversity and equity in transportation service quality position
    • help collect data of transportation services received by members of diverse communities around Seattle
    • $17/hr
    • Contact CEE Professor Don MacKenzie (dwhm@uw.edu)

• Cultural Artifacts?
• Background data
• Panel
• Allies
Hackssessible

http://www.accessmapseattle.com/

App that helps people in wheelchairs plan travel routes wins first place at civic hackathon

BY TAYLOR SOPER on April 20, 2013 at 10:43 am

For most people, using a tool like Google Maps is an adequate way to find walking or public transit directions. But for those who face mobility challenges, be it a disability or a temporary injury, it can be difficult to know where closed sidewalks, steep inclines, ramp curbs, or other obstacles may exist.

Hack the Commute winners Nick Bolian, Veronika Speeua, Allie Duford, and Reagan Middlebrook pose with Deputy Mayor of Seattle Kate Joncas (third from left).
National Disabilities Statistics

• 11% of undergraduates reported having a disability (2003-04, 2007-08)
  – 43% male, 57% female (07-08); same as w/o disabilities

• Science and Engineering (2012):

  ![Pie charts showing percentages of S/E undergrads and S/E Doctorate Students]

  - S/E undergrads: 90% 10%
  - S/E Doctorate Students: 95% 5%

• Roughly two million employed scientists and engineers with disabilities in the U.S.

## UW Disabilities Statistics F13

<table>
<thead>
<tr>
<th>Across UW Seattle</th>
<th>91-92</th>
<th>01-02</th>
<th>11-12</th>
<th>12-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaf/Hearing</td>
<td>25</td>
<td>23</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>Mobility</td>
<td>96</td>
<td>96</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td>Speech/Lang</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Learning Dis</td>
<td>120</td>
<td>145</td>
<td>505</td>
<td>495</td>
</tr>
<tr>
<td>Blind/Visual</td>
<td>37</td>
<td>24</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Chronic Hlth</td>
<td>0</td>
<td>61</td>
<td>206</td>
<td>233</td>
</tr>
<tr>
<td>Neuro/CNS</td>
<td>0</td>
<td>34</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Psych/Emot</td>
<td>0</td>
<td>32</td>
<td>137</td>
<td>166</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>All other functional limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(91-93)</td>
<td>126</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent Total</td>
<td>406</td>
<td>418</td>
<td>1023</td>
<td>1074</td>
</tr>
<tr>
<td>Overall Total Trends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 year trends</td>
<td></td>
<td>3%</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>20 year trend</td>
<td></td>
<td></td>
<td>60%</td>
<td></td>
</tr>
</tbody>
</table>

1352 UW students registered with DSO

85% with an invisible disability
UW STEM Disability Statistics

Percentage of UW STEM Majors who are Students with Disabilities

<table>
<thead>
<tr>
<th></th>
<th>2007-08</th>
<th>2010-11</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
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<tbody>
<tr>
<td>Bachelors</td>
<td>629/16499</td>
<td>51/4367</td>
<td>18/1118</td>
<td></td>
<td></td>
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<tr>
<td>Masters</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2013-14

Bachelors: 629/16499
Masters: 51/4367
Doctoral: 18/1118
114 known students with disabilities enrolled in CoE in Fall 2013
- 35 of these students are also URM
- 33 of these students are women

<table>
<thead>
<tr>
<th>CoE Degree Type</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE</td>
<td>40</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>PhD</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Grad non-matric</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MS</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>None specified (pre-Engr)</td>
<td>15</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Pre-Doctoral</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
College of Engineering Students with Disabilities Data

Number of Students

- Dear/Hearing
- Mobility
- Speech/Lang
- Learning Dis
- Blind/Visual
- Chronic Hlth
- Neuro/CNS
- Psych/Emot
- **Other**

2011  2012  2013

[Graph showing number of students with different disabilities across years]
Students with Disabilities

• Research shows that the more disabled students are educated in regular classrooms, the better they do socially and academically.

• Equal treatment ≠ fair treatment.

• Fair treatment is giving students what they need to have a successful learning experience.
Readings for today

1) Personal stories – strategies, stereotypes
2) Underrepresentation in STEM fields
3) Different types of disabilities – some can be silent or invisible

Exposure to and awareness of wide variety of disabilities and impact of a disability
Impact of design and engineering for disabled populations

- Curb cuts
- Telephone
- GPS
- AudioBooks
- Tape recorder – low cost reliable talking book machine (1948)
- Email
- Vibrating and alphanumeric pagers
- Flatbed scanner
- Closed captioning
- Speech-input technology for computer devices
- Optical character recognition software (to go with the scanner)
- Wheelchair access ramps into buildings

Other examples: The Electronic Curb-Cut Effect
(http://www.icdri.org/technology/ecceff.htm)
PANEL
Discussion

• What did you learn?
Allyship

“Social justice allies are members of dominant social groups (e.g., men, whites, heterosexuals) who are working to end the system of oppression that gives them greater privilege and power based upon their social group membership” (Broido, 2000).
Conditions for Being a “Truly Effective Ally” (Helms 1995)

• Seeks to understand one’s own oppressive socialization as a means of liberation (*self-awareness*)
• Eager to work with members of oppressed groups
• Understands the complexity of the intersecting nature of all forms of oppression
• Talking Back
Allies Interrupting Bias

Personal Support

Education of Others

Institutional Change
Assignments

• Readings for next week – introduction to another Jigsaw

• Catalyst Reading Survey